Los Angeles County Department of Public Works

Termino Avenue Storm Drain Project

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- Construction Dewatering
- Staging Areas
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- Utilities
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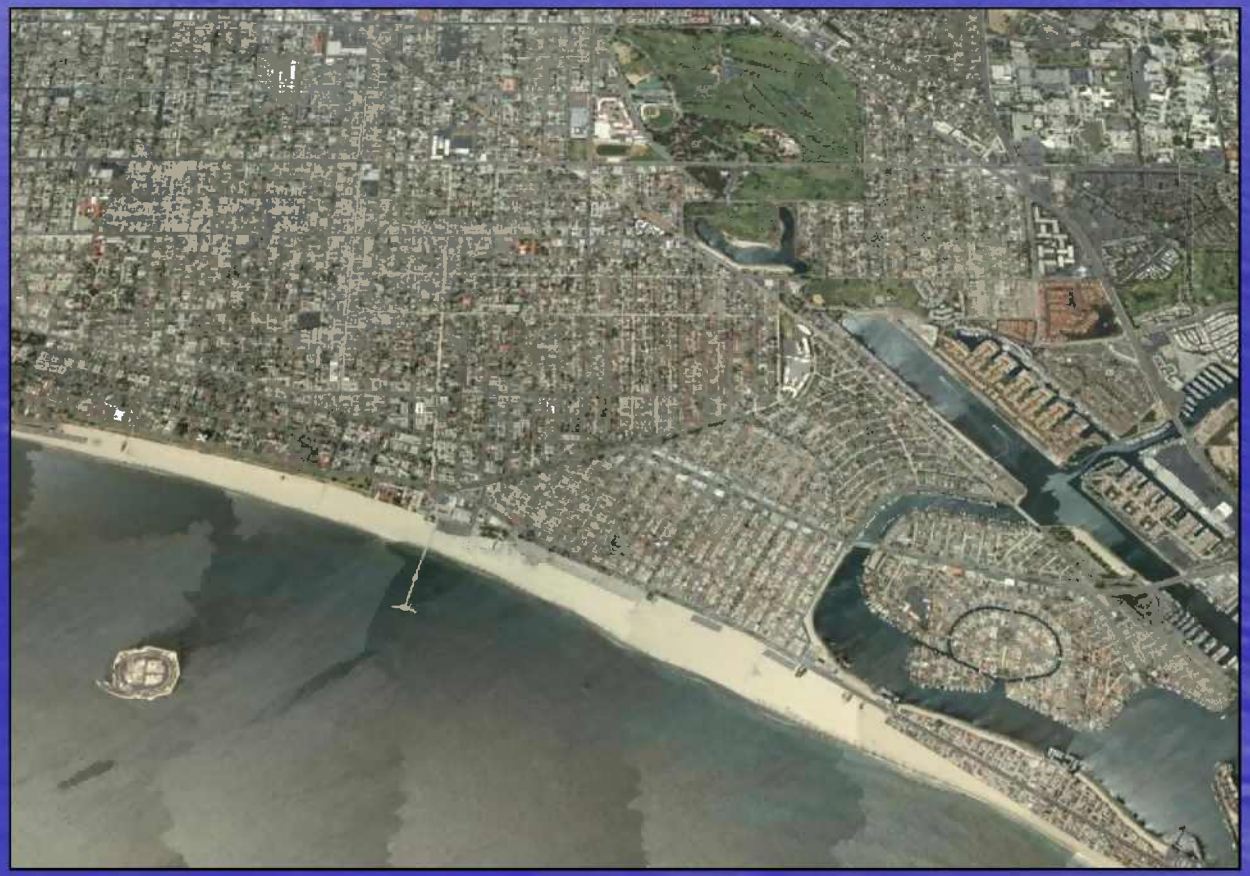


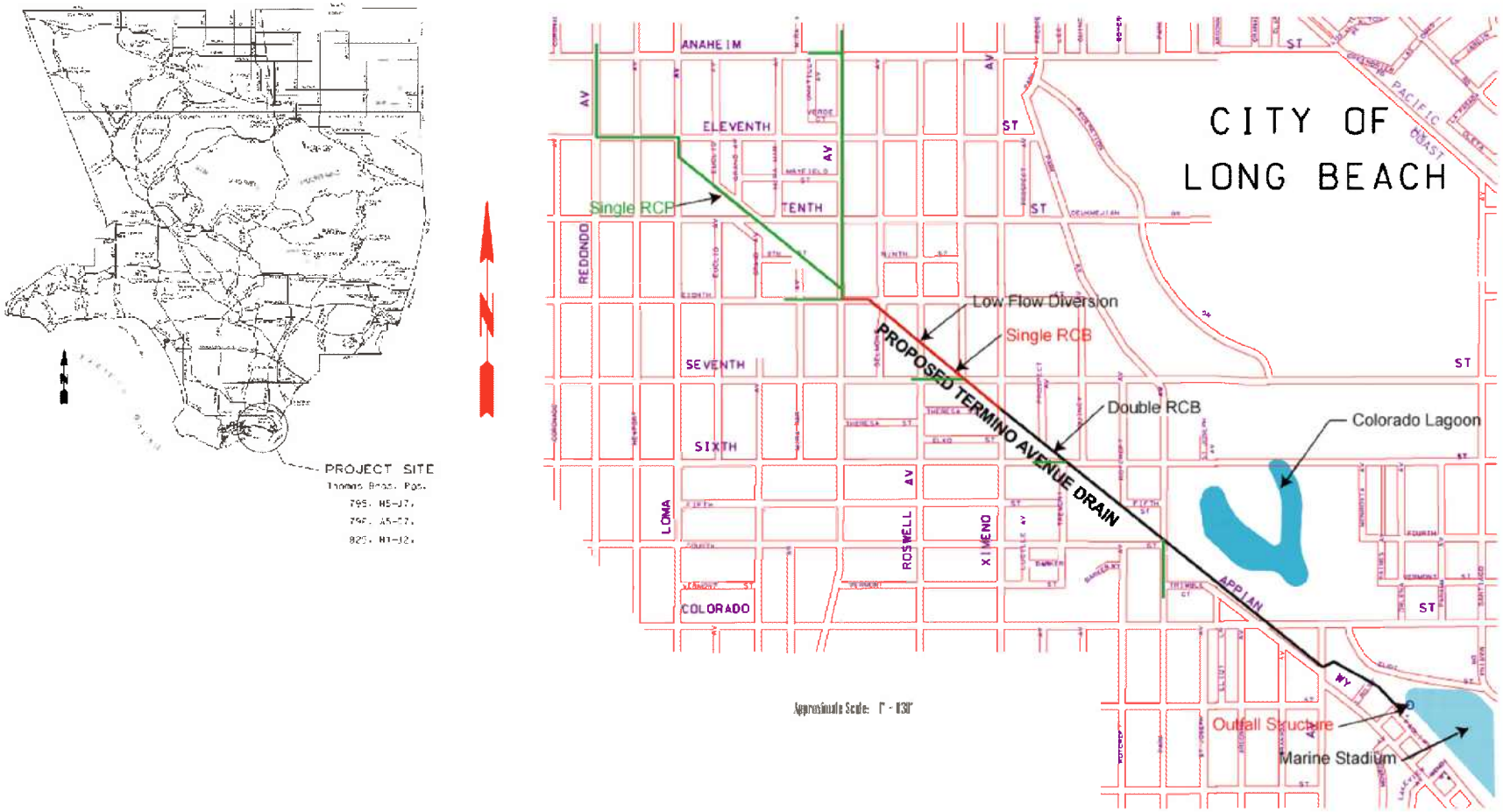
General Project Description

Storm Drain System Components:

- Mainline is 8,100 feet with 4,200 feet of laterals
- Outfall Structure into Marine Stadium
- Single and Double Reinforced Concrete Box (RCB) Structure
- Reinforced Concrete Pipe (RCP) 78” to 36” diameter
- Low Flow Diversion Structure at Roswell Ave
- Catch basin inserts

General Project Description

Storm Drain Alignment and Structure



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Site Location Map
Termino Avenue Drain
City of Long Beach

General Project Description

Outfall Structure into Marine Stadium

- Requires installation of a Cofferdam
- Outfall Structure will be recessed within the existing rip-rap slope
- No dredging of the floor of Marine Stadium
- Energy dissipation blocks to slow velocity
- Engineering controls will be implemented during construction to reduce turbidity in Marine Stadium

General Project Description

Outfall Structure into Marine Stadium

Dimensions	Trapezoidal Shape 38' L x 19' - 27' W x 11' H
Invert Depth	Footings extend 17.7' below surface

General Project Description

Coffer Dam Details

- Constructed with "Water-tight" interlocking sheet piles or impermeable membrane
- Semi-circular design with radius of 46 feet
- Sheet piles extend 28 feet below sea level and approximately 20 feet below Marine Stadium floor

General Project Description

Double Reinforced Concrete Box (RCB) Structure

- Marine Stadium to Ximeno Avenue

Length	4,324 ft or 0.82 mile
Dimensions	From 9.0' W x 8.0' H to 8.0' W x 5.6' H
Invert Depth	8 to 18 feet
GW Depth	4 to 13 feet

- Requires Construction Dewatering from Marine Stadium to Park Avenue

General Project Description

Single Reinforced Concrete Box (RCB) Structure

- Ximeno Avenue to Termino Avenue
- No Construction Dewatering Required

Length	1,844 ft or 0.35 mile
Dimensions	From 10.0' W x 5.6' H to 6.0' W x 4.0'
Invert Depth	5 to 26 feet

General Project Description

Reinforced Concrete Pipe (RCP)

- Termino Avenue to Redondo Ave and all Laterals
- No Construction Dewatering Required

Diameter	Total Length	Invert Depth
78”	566’	20’
72”	1159’	10’ to 26’
48”	3000’	7’ to 24’
36”	1300’	7’ to 24’

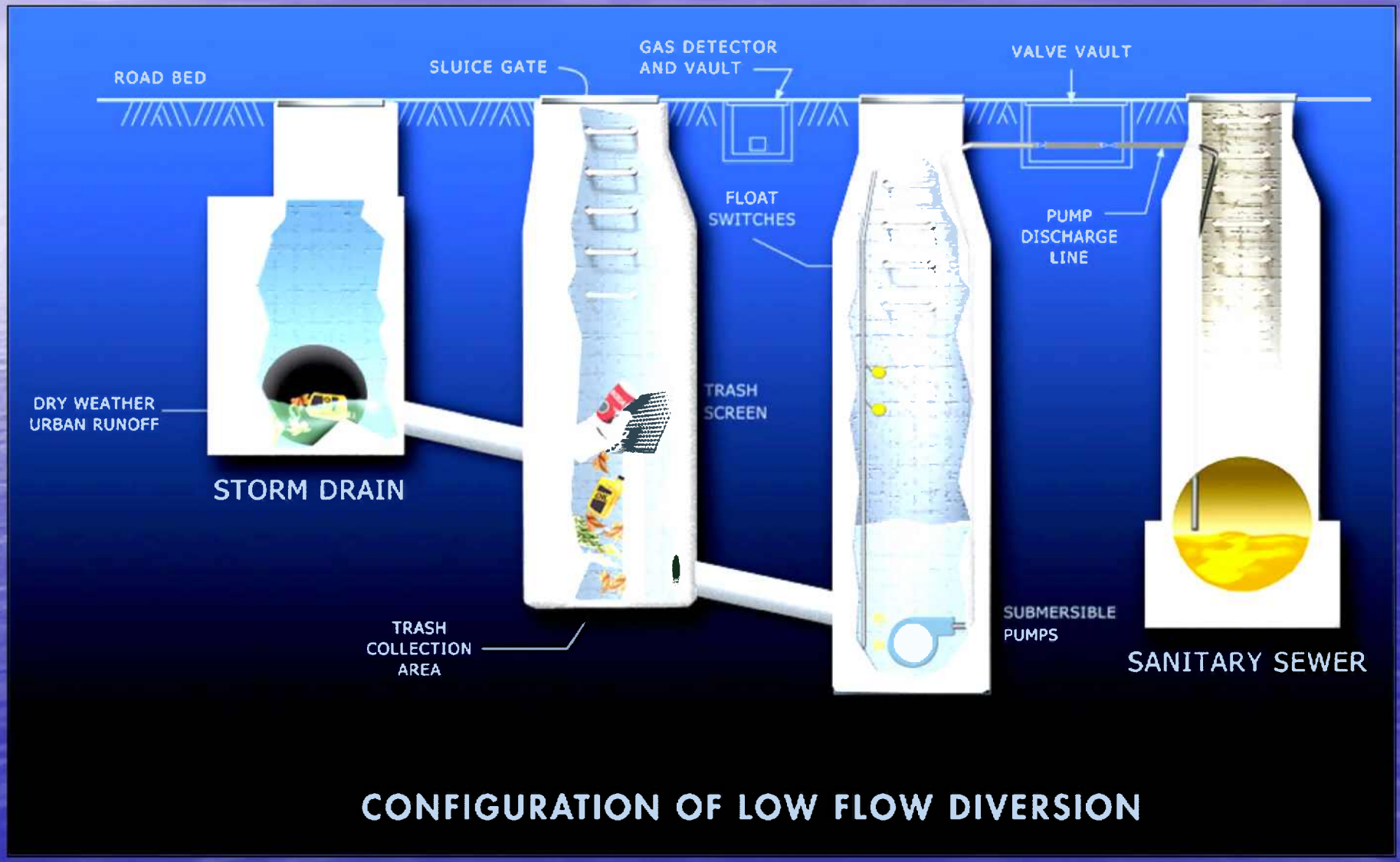
General Project Description

Low Flow Diversion Structure

- Located at Roswell Avenue
- Diverts up to 25,000 gallons per day of Non-Storm Water Flows to the Sanitary Sewer
- Total Depth is approximately 30.5 feet below surface
- Groundwater at 23 feet below surface
- Requires Construction Dewatering or Engineering Controls

General Project Description

Low Flow Diversion Structure



CONFIGURATION OF LOW FLOW DIVERSION

General Project Description

Catch Basin Post-Construction BMP Inserts

- Catch Basin Screens
  - External Automatic Retractable Screens (ARS)
  - Internal Connector Pipe Screens (CPS)
  - Complies with the RWQCB's "Full Capture Requirements"

General Project Description

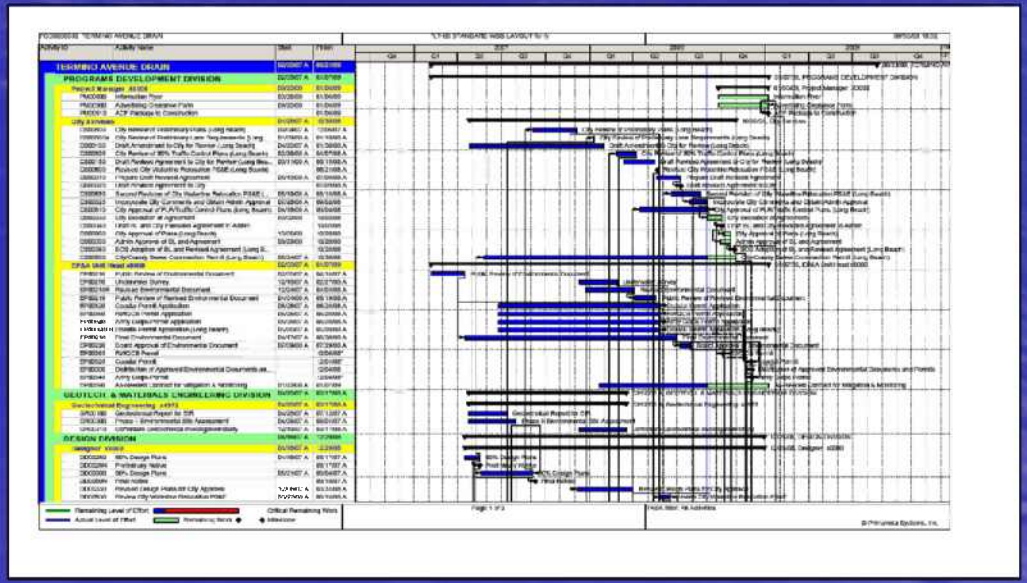
Catch Basin Post-Construction BMP Inserts

- AbTech Smart Sponge® Filter
  - Polymer filter material to remove and encapsulates Oil and Grease (70 to 90% of hydrocarbons)
  - Removes Bacteria using antimicrobial agent chemically and permanently bound to the sponge
  - Antimicrobial agent is active but does not leach or leak, avoiding any downstream toxicity issues.

Proposed Schedule

Major Schedule Milestones Dates

- Signed Design Plans – December 2008
- Advertise Project – February 2009
- Award Project – June 2009
- Start Construction – September 2009
- Approximately 26 months to complete



Construction Sequence

Two General Phases of Work

- **Phase I – Outfall Structure to Park Avenue**
  - Approximately 8 months to complete Phase I
  - If Phase I is scheduled between Memorial Day and Labor Day, then the following two stages will be employed:
  - **Stage I** – Nieto Ave to Park Ave
  - **Stage II** – Outfall Structure to Nieto Ave (after Labor day)
    - Remove cofferdam and place a temporary bulkhead at Park Ave
    - Storm drain will be in full operation from Park Ave to Marine Stadium
    - Final pavement and completely restore to public use

Construction Sequence

- **Phase II – Park Avenue to Anaheim Street**
  - **Stage I** – Park Ave to Ximeno St
    - Approximately 3 months to complete
    - Allows connection to existing 39”/48” storm drains prior to October 15
    - Remove bulkhead at Park Ave and install bulkhead at Ximeno St
    - Storm drain will be in full operation from Ximeno St to Marine Stadium
  - **Stage II** – Ximeno Street to Anaheim St
    - Approximately 16 months to complete
    - Project Complete

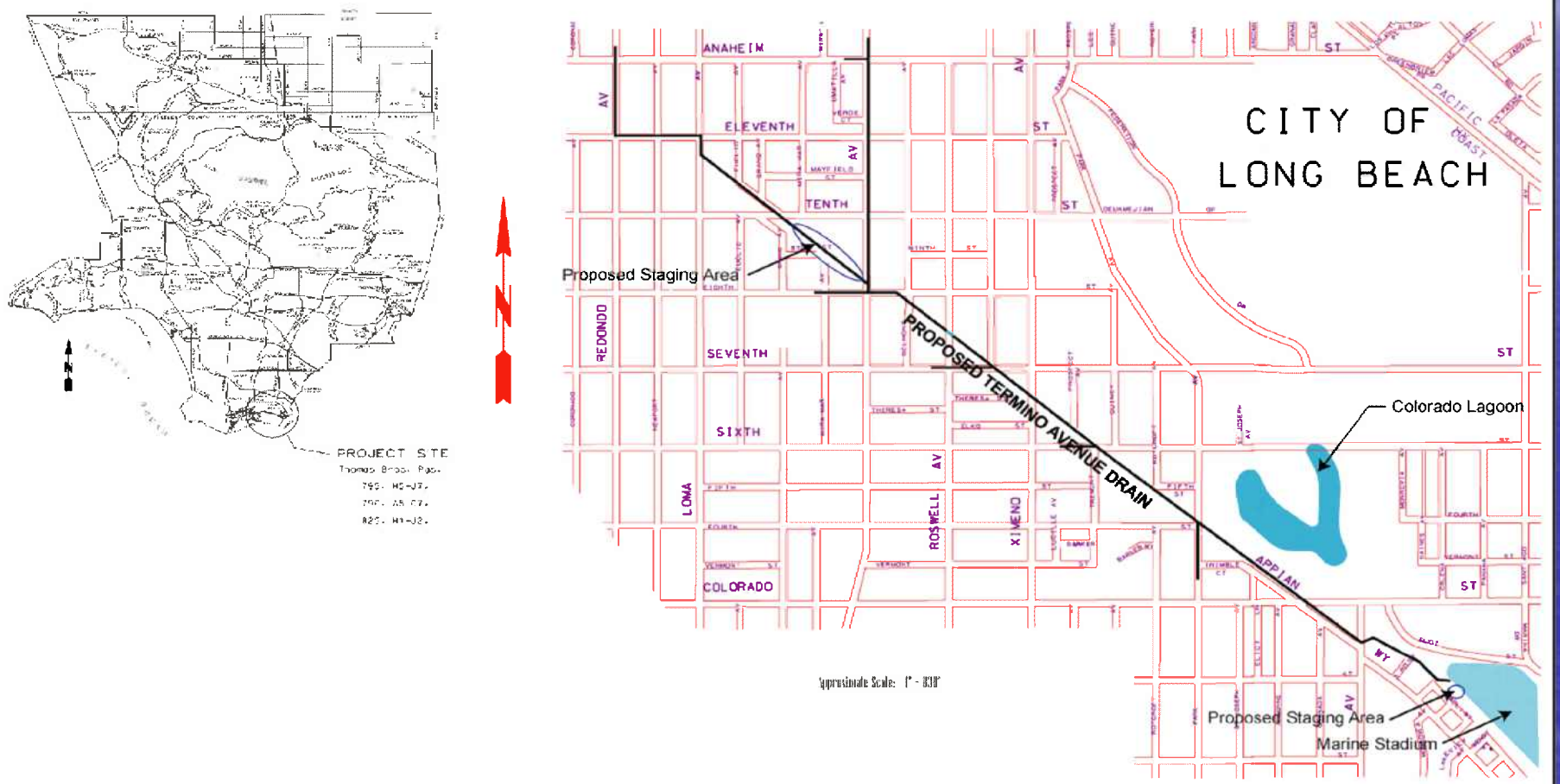
Proposed Staging Areas

Two Proposed Contractor Staging Areas

- Marine Stadium Parking Area
  - Available during Phase I Construction Only
  - Not Available from Memorial Day to Labor Day
- Former PE Right-of-Way Between 8th St and 10th St
  - Available during Phase I and Phase II Construction

Proposed Staging Areas

Two Proposed Contractor Staging Areas



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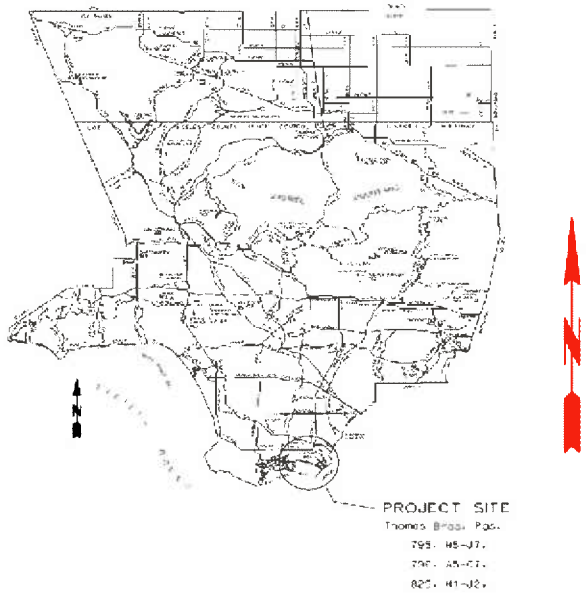
Site Location Map
Termino Avenue Drain
City of Long Beach

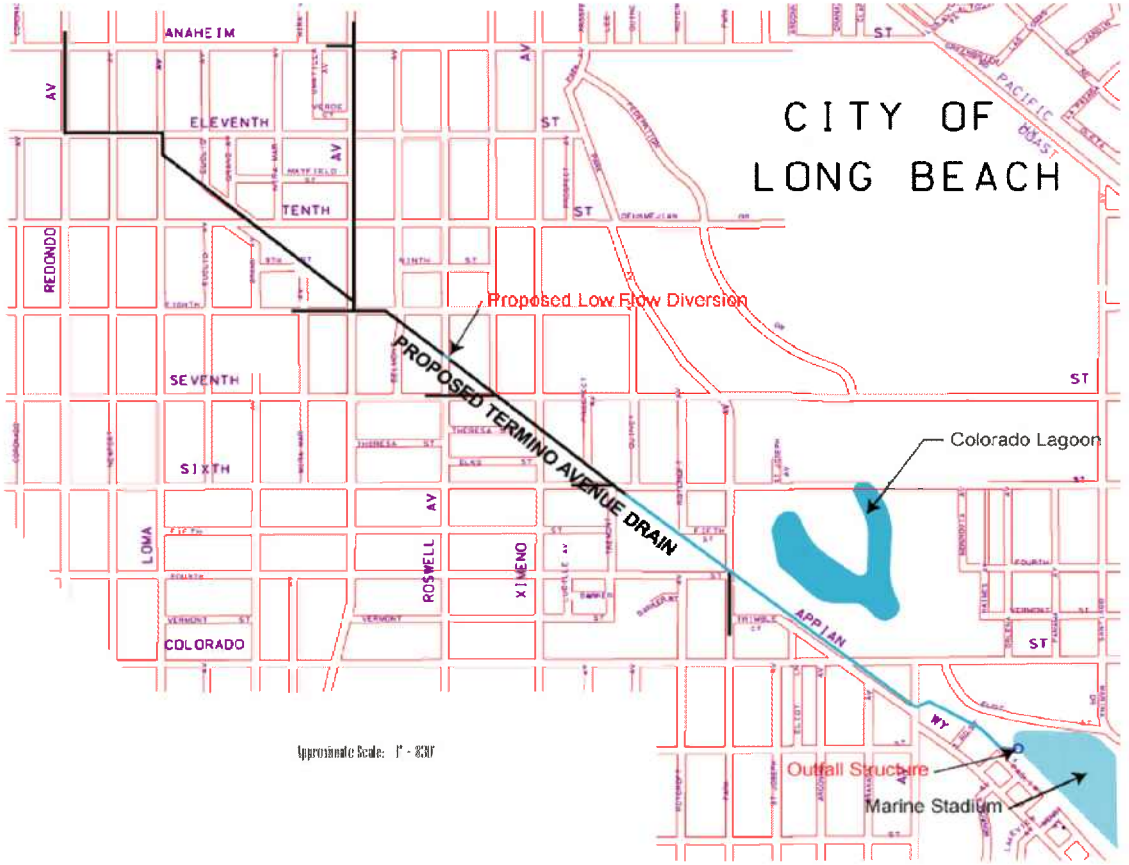
Storm Water

- Storm Water Pollution Prevention Plan (SWPPP) will be required for this Project
- SWPPP will be Reviewed and Approved by the County
- Weekly Inspections by Contractor and County
- Dust Control and Dirt/Soil Tracking will Strictly Enforced

Construction Dewatering

Groundwater encountered from Marine Stadium to approximately Park Avenue





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Site Location Map
Termino Avenue Drain
City of Long Beach

Construction Dewatering

Groundwater Elevations vary from approximately 4 to 13 feet deep below ground surface

May Vary with tides

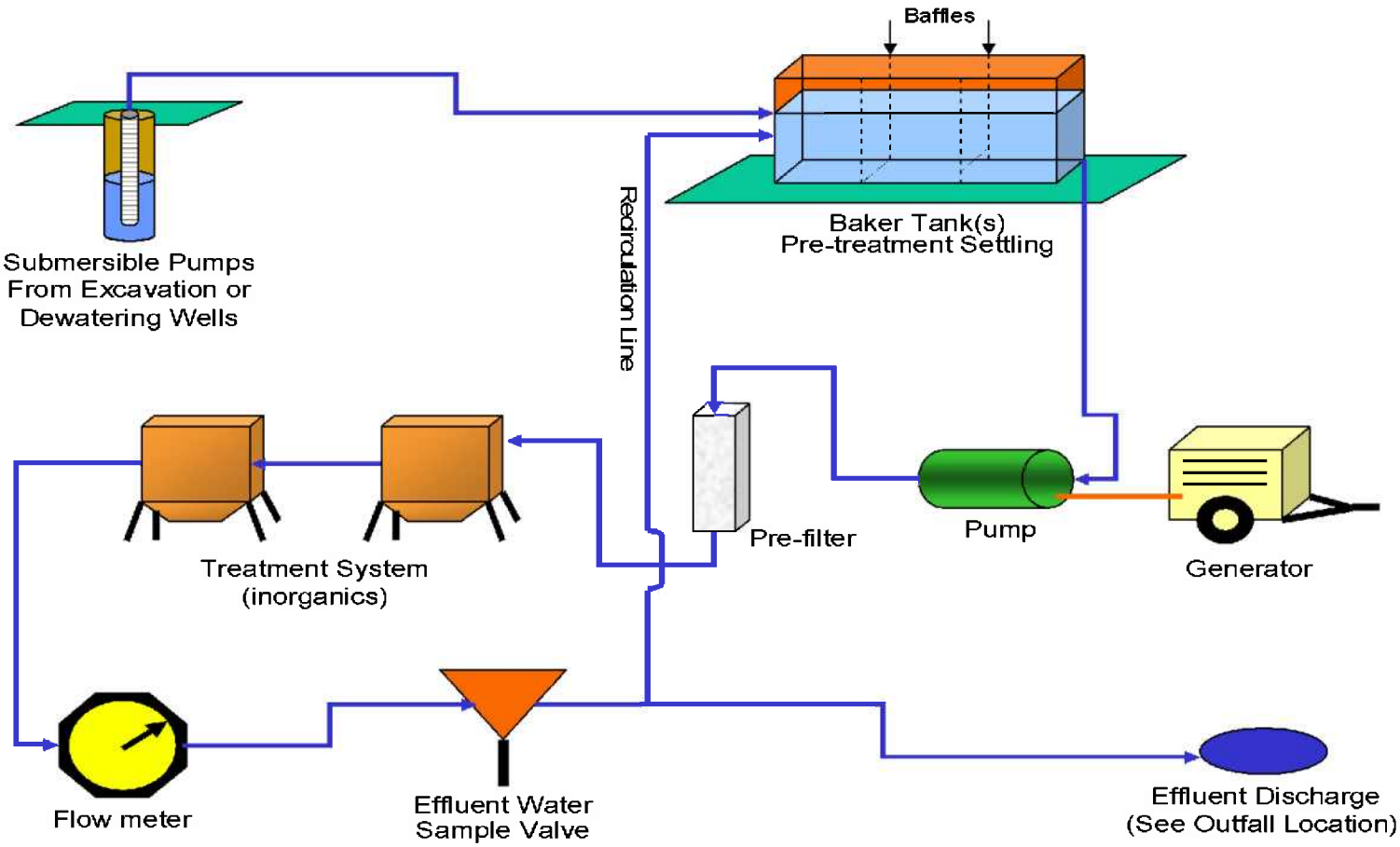
Construction Dewatering

The Construction Dewatering Permit (RWQCB) Requires:

- Maximum of 840,000 gallons per day (gpd) or 583 gallons per minute (GPM) discharge
- Groundwater Treatment System consists of:
  - Settling tanks and filters to treat for solids
  - Ion exchange system to treat for metals
- Effluent Monitoring
  - Daily for first week of discharge
  - Weekly
- Submit Monthly Monitoring Reports to RWQCB

Construction Dewatering

Proposed Treatment System Diagram



Construction Dewatering

Typical Groundwater Treatment System

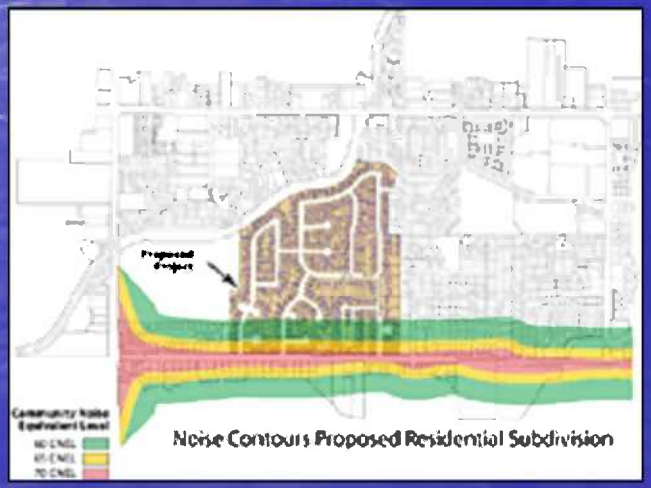
Construction Dewatering

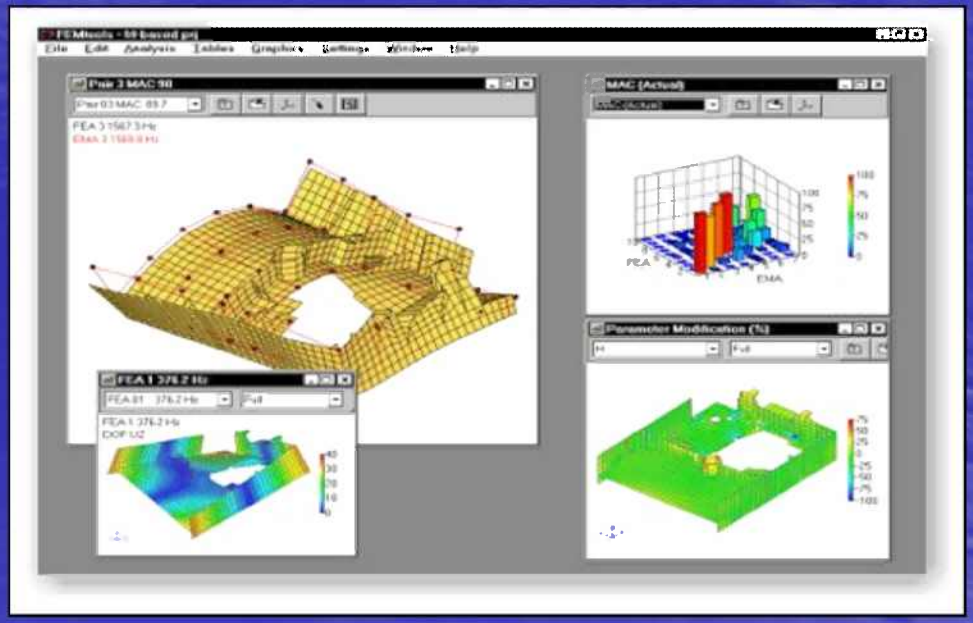
Typical Ion Exchange Treatment System

Noise Control

Noise Assessment Report

- Contractor shall submit to the Agency for review and approval a Noise Assessment Report
- Noise Assessment shall include a three dimensional (3D) construction noise model using a noise modeling software (such as FHWA RCNM® or SoundPlan®)





Noise Control

Noise Assessment Report

The model shall be used to predict the noise impact to the closest residential and commercial buildings for the following Principal Noise Sources:

- Contractor's staging areas
- Dewatering systems and dewatering treatment systems
- Construction of the cofferdam and outfall structure in Marine Stadium
- Installation of shoring systems along the storm drain alignment
- All other areas of major construction related noise

Noise Control

Noise Abatement Plan

- Contractor shall submit to the Agency for review and approval a Noise Abatement Plan
- Action Plan to “Mitigate Noise”
- Identifies the Noise Mitigation Measures to address the maximum predicted noise levels from the Noise Assessment Report
- The Contractor shall designate a Noise Assessment and Abatement Manager (NAAM) or Consultant

Noise Control

Noise Mitigation Measures

- All Construction equipment shall be fitted with noise shielding, enclosures, and muffling devices to reduce noise levels

Noise Control

Noise Mitigation Measures

- Sound Blankets to direct noise away from nearby residences and businesses

Noise Control

Noise Mitigation Measures

- Temporary Sound Walls

Utilities

Twenty utility companies are directly and indirectly involved in this Project

- Five of the twenty are operated by City of Long Beach
- The County has a dedicated Utility Coordinator for this project
- Utilities include electrical, telecommunications, water, sanitary sewer, and petroleum pipelines

Traffic Control

Traffic Control will be phased to correspond with the Construction Sequence Phases

- **Phase I** – Outfall Structure to Park Avenue
  - **Stage I** – Nieto Ave to Park Ave
    - Full Closure of Nieto Ave, Appian Way, Colorado Blvd, and Park Ave only as the trench excavation crossing these streets
    - Full closure of metered parking lot adjacent to Appian Way – Appian Way will remain one lane in each direction
  - **Stage II** – Outfall Structure to Nieto Ave
    - No traffic control or closure from Memorial Day and Labor Day
    - Full Closure of access road from Marine Stadium Entrance to Nieto Ave
    - Closure of northern portion of the Marine Stadium parking area

Traffic Control

- **Phase II** – Park Avenue to Anaheim Street
  - 7th St and Ximeno Ave will remain completely open during mainline construction – Storm drain pipe will be jacked or tunneled under these streets
  - 8th St, Mayfield St, and 11th St will be closed only as the trench excavation crossing these streets
  - During construction of laterals, 7th St, Redondo Ave, and 10th St will open with one lane in each direction

- Traffic Control will be conducted using an effective combination of changeable message signs, arrow boards, temporary striping, K-rails/crash cushions, delineators, and flagging personnel

Questions